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PROBLEMS FOR SOLUTION.

ARITHMETIC.

148. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

According to his contract a professor is to receive \$1800. in cash plus board, etc., for his services during a scholastic year of nine months. This sum is payable in equal installments of \$200. at the end of each scholastic month. The treasurer, however, paid the professor in ten equal installments of \$180. The last two installments were paid Monday and Thursday of the last week in the scholastic year. Regarding money worth 6%, out of how much was the professor defrauded by the wiley treasurer?

149. Proposed by JOSIAH H. DRUMMOND, LL. D., Portland, Me.

A wine cask contains 256 gallons of wine; a certain quantity is drawn off and the cask is filled with water; the same quantity of the mixture is drawn off and the cask again filled with water and so on for four draughts, when there remain only 81 gallons of wine in the cask. How many gallons of wine are drawn at each of the draughts?—[*Colburn's Algebra*.]

* ** Solutions of these problems should be sent to B. F. Finkel not later than Dec. 10.

ALGEBRA.

145. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

Factorize $2b^2c^2 + 2c^2a^2 + 2a^2b^2 + 2a^2d^2 + 2b^2d^2 + 2c^2d^2 - a^4 - b^4 - c^4 - d^4$.

146. Proposed by B. F. YANNEY, Professor of Mathematics, Mount Union College, Alliance, Ohio.

If the series 1, 3, 5, . . . $2n-1$, . . . be divided into successive groups of r terms each, the sum of the terms of the n th group will be $(2n-1)$ times the sum of the terms of the first group, or $(2n-1)r^2$.

* ** Solutions of these problems should be sent to J. M. Colaw not later than Dec. 10.

GEOMETRY.

175. Proposed by W. P. WEBBER, Mississippi Normal College, Houston, Miss.

A field is enclosed by a fence in circular form and a straight gate 20 feet wide. The fence is 100 feet in length. How much land in the field? [Solution by most elementary method possible.]

176. Proposed by R. A. WELLS, Franklin College, New Athens, Ohio.

If there be three straight lines which meet in a point, and the arbitrary constants of their equations, expressed in the slope form, be taken as the coördinates of three points, these three points will lie in a straight line.

* ** Solutions of these problem should be sent to B. F. Finkel not later than Dec. 10.